

Chest Scheme				
# How to Reach the Diagnosis ?!				
■ from H/O	<p>N.B. TB ال خود بالك من تشخيص ال [1. Chest Symptoms , 2. Toxic Symptoms &amp; 3. Treatment of the Patient]</p> <p>1- History of TB &amp; Now Patient Complaining from <b>Dyspnea → Pulmonary Fibrosis</b></p> <p>2- History of Pleural Effusion (عملوا لي بزل) &amp; Now Patient Complaining from <b>Dyspnea → Pleural Fibrosis</b> (take care! from the little Possibility for Effusion)</p> <p>3- Cough + Expectoration (و fulfill ¾ or more from 4Ps) → <b>S.L.S.</b> (+ Detect the Site of Lesion from H/O)</p> <p>4- Cough + Expectoration + Dyspnea + Wheezes (شكوى رباعية) → <b>C.O.P.D.</b> (take care! The is a little Possibility to be Associated with S.L.S.)</p> <p>5- عند نزول حالات الجراحة → <b>Chest Surgery Cases → 3</b> ناقش الإحتمالات ال (Follow-up, Complications or Recurrence)</p>			
■ from General Exam	<p>1- Clubbing : ● Hypoxic “with Cyanosis” → <b>Interstitial Pulmonary Fibrosis (I.P.F.)</b> خلاص الحالة أتشخصت 100% مفيش غيرها ● Toxic → <b>100% S.L.S</b> (ولكن عدم وجوده لا ينفي)</p> <p>2- Edema L.L. → <b>Cor-Pulmonale</b> (&amp; Revise the D.D. of Edema in Chest Patients)</p> <p>±3- if Patient Coughing → <b>Don’t Forget!</b> to Search for Complications of Cough (esp. Hernia &amp; Puffiness on Eyelid)</p> <p>±4- in C.O.P.D. Patients → <b>Don’t Forget!</b> to Search for Complications of Treatment :</p> <ul style="list-style-type: none"><li>● Broncho-Dilator : Tremors &amp; Pulse</li><li>● Cortisone : cushingoid</li></ul> <p>±5- <b>Don’t Forget!</b> to Search for Respiratory Failure Signs (esp. Cyanosis, <u>Flapping Tremors</u>, Disturbance of Conscious Level) ومش هتلاقيهم</p>			
■ from Local Exam	<b>1<sup>st</sup> Inspection for</b>			
	<p>1- Expansion عشان دول إذا جبتهم .. هـ يفيدوا جداً في التشخيص</p> <p>2- Symmetry</p>			
	<b>then Auscultation</b>			
	<table><tr><td>هـ أسمع فين</td><td>?</td><td>إذا عرفت الناحية المصابة .. أسمعها وأخلص إذا ما عرفتهاش .. أسمع بـ الترتيب بقى منطقة منطقة</td></tr></table>	هـ أسمع فين	?	إذا عرفت الناحية المصابة .. أسمعها وأخلص إذا ما عرفتهاش .. أسمع بـ الترتيب بقى منطقة منطقة
	هـ أسمع فين	?	إذا عرفت الناحية المصابة .. أسمعها وأخلص إذا ما عرفتهاش .. أسمع بـ الترتيب بقى منطقة منطقة	
<table><tr><td>هـ أسمع أيه</td><td>?</td><td><div>● Breath Sounds</div><div>● Additional Sounds</div><div>D.D. by 4×4</div><div>1- Diminished Vesicular Breathing (نفس زي الطبيعي بس صوته واطي) → <b>Fibrosis</b></div><div>2- Diminished Vesicular Breathing with Prolonged Expiration → <b>C.O.P.D.</b></div><div>3- Bronchial Breathing → <b>S.L.S.</b> (Cavity)</div><div>1- Wheezes → <b>C.O.P.D.</b></div><div>2- Crepitation → <b>Fibrosis , Bronchi-Ectasis</b></div></td></tr></table>	هـ أسمع أيه	?	<div>● Breath Sounds</div> <div>● Additional Sounds</div> <div>D.D. by 4×4</div> <div>1- Diminished Vesicular Breathing (نفس زي الطبيعي بس صوته واطي) → <b>Fibrosis</b></div> <div>2- Diminished Vesicular Breathing with Prolonged Expiration → <b>C.O.P.D.</b></div> <div>3- Bronchial Breathing → <b>S.L.S.</b> (Cavity)</div> <div>1- Wheezes → <b>C.O.P.D.</b></div> <div>2- Crepitation → <b>Fibrosis , Bronchi-Ectasis</b></div>	
هـ أسمع أيه	?	<div>● Breath Sounds</div> <div>● Additional Sounds</div> <div>D.D. by 4×4</div> <div>1- Diminished Vesicular Breathing (نفس زي الطبيعي بس صوته واطي) → <b>Fibrosis</b></div> <div>2- Diminished Vesicular Breathing with Prolonged Expiration → <b>C.O.P.D.</b></div> <div>3- Bronchial Breathing → <b>S.L.S.</b> (Cavity)</div> <div>1- Wheezes → <b>C.O.P.D.</b></div> <div>2- Crepitation → <b>Fibrosis , Bronchi-Ectasis</b></div>		
	<b>then Repeat All Local Exam Again After you reached the Dx ..</b> بعد ما طلعت التشخيص .. أرجع أشتغل بقى ودور ع الي متوقع تلاقيه وأهتم بيه ..			

C.O.P.D. Chronic Bronchitis + Emphysema					
■ Etiology :		• Pollution “Smoking” بس إحنا مش عارفين السبب الحقيقي أيه .. إما بـ نتهم فيها الـ			
■ Complications :		• Recurrent Chest Infection <b>**الأشهر</b> • Cor-Pulmonale • Coughing			
■ H/O : بنطلع منه بـ 3 حجات	- Personal H/O	• Smoking • Working “مصنع أسمنت” • “محجل قطن .. مصنع أسمنت”		H/O لي أيه	Etiology
	- Present H/O	• Resp. Failure by Cyanosis “إذا طلع مش موجود ما تقولش أنك سألتته من الأساس” • Cor-Pulmonale by Systemic Venous Congestion “it’s Very Late Complication usually”		Function & Complications	2
		• Chronic Coughing [يوميًا لمدة 3 أشهر متتالية في السنة الواحدة لمدة سنتين ع الأقل] • Expectoration [Important to exclude S.L.S. : Big, Purulent, Postural & Bad Odour & Bronchial Asthma] • Wheezes [CONTINUOUS] و Diff. from Bronchial Asthma • DYSPNEA [The LIMITING FACTOR]		Main Diagnosis	3
■ General Exam. :	- -VE	• NEVER Clubbing .. if You Find it , then the cause is something else			
	- Functional	• Cyanosis, Flapping Tremors & Disturbed Conscious Level			
	- Complications	لـ الكحة	• Eye Puffiness “فوق” • Hernia “تحت”		
		لـ المرض	• Cor-Pulmonale [Lower Limb Edema, Liver Tender]		
		لـ العلاج	• All Pt. will be on Broncho-Dilator (β Agonist) → Arrhythmia & Tachy-Cardia ... and Fine Tremors • ± Steroids “مؤجل”		
			in rural areas .. the Pt. will take the Broncho-Dilator by (Injections) .. so, this is also a Complication → You Should search in these cases for Multiple Injection Signs		
			- D.D. of Multiple Injection Signs : • Addictions • Diabetes “Insulin Injection” • Chest “Broncho-Dilator”		
هـ تلاقي 3 نتائج					
■ Local Exam. : هـ تلاقي 3 نتائج	• Bilateral Limitation of Expansion وما تنساش القانون : هـ تبدأ في المقارنة من أي ناحية لـ أن الأثنين بايظين .. بس اللي تبدأ بيه .. هـ تكمل بيه كل مرة الأول			+VE	Bilateral Disease
	• Symmetrical “لا يخلي حاجة تطلع ولا حاجة تطبق” • Mediastinum is Central “لا يشد ولا يزق” • T.V.F. is Equal on Both Sides			-VE	
	• Barrel Shaped Chest • Absent Apex • Ptosed Liver • Hyper-inflated Lung “on Percussion” • Tracheal Tug “Low Diaphragm” & Hoover Sign “Flat Diaphragm”			Signs of Hyper-inflation	
	• Wheezes • Diminished Vesicular Breathing + Vesicular Breathing with Prolonged Expiration			by Auscultation	Signs of Narrowing
	± Signs of Resp. Difficulty (Resp. Ms. Action)				
	■ Investigations :		■ Treatment :		
• The Best Investigation is Pulmonary Function (will show Obstructive Pattern)		The Aim of ttt is to Relief the Symptoms & +++ Survival			
X-Ray [HYPER-INFLATION] #الي فيه منه 2 .. ليه صفتين ..		الحالة سادة ..			
• Lung: - Hyper-Translucent - ++ Volume “Voluminous” • Ribs: - Wide - Horizontal • Diaphragm: - Low - Flat #الي فيه منه 1 .. ليه صفة واحدة ..		STOP FURTHER IRRITATION [العيان ده هـ نقوله .. سجاراتك أو عُمرِك !] A • Broncho-Dilators : COMINATION of 3 1- Sympathomimetic (β Agonist) “The MOST IMPORTANT” N.B. Long Acting is better than Short Acting 2- Parasympatholytic (Anti-Cholinergic) 3- Direct (Aminophylline) B • Remove Secretions : as it may be DRY → produce Mucous Plug → Lung Collapse #أشيله إزاي ؟! أحسن حاجة العيان يشرب مية كتييير (بـ التحديد مشروبات ساخنة) +++ Hydration بس في مشكلة .. أن المية الكثير ممكن تعمل << Cor-Pulmonale فـ هأبقى عايز أنزل المية ديه .. وأديله Diuretics فـ الأفضل أني أعمل له “حمامات بخار” .. Nebulizer H2O بدل ما أديله مية كثير ومتضرر أديله ومعها دوا ينزلها C • Home O2 Therapy (Domiciliary O2) : Daily “12-16 Hrs. / Day” for Relief Symptoms & +++ Survival O2 Tube or O2 Concentrator في مصر بـ يوصلوا له في البيت بره الحالة بـ إضافات .. • Infected [Yellow Expectoration + Late Inspiratory Crepitations] → Antibiotics • Cor-Pulmonale → Diuretics • Resp. Failure !			

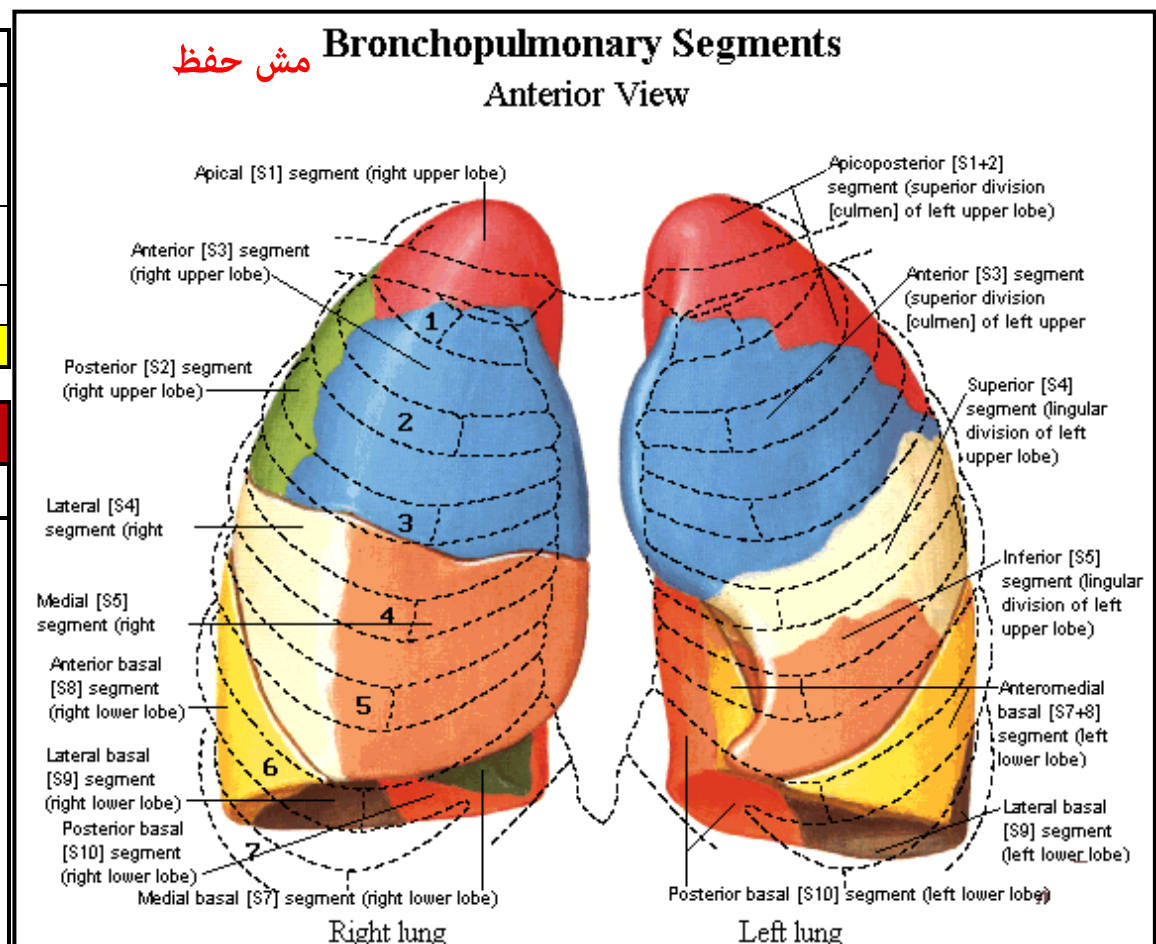
# Chest Investigations & Treatment of TB .. from Dr. Ehab

\* Surface Anatomy of the Lung (Lobes & Fissures) : **أشعة عملي (شفوي) هام**

Back View	Lateral View	Front View	
			<b>Greater Oblique Fissure</b>
It's called "Greater" as it's Appear in All 3 Views			
<ul style="list-style-type: none"> <li>• Mid-Line</li> <li>• Spinous Process of T3</li> </ul>	<ul style="list-style-type: none"> <li>• Mid-Axillary Line (MXL)</li> <li>• 5<sup>th</sup> Rib or Inter-Costal Space</li> </ul>	<ul style="list-style-type: none"> <li>• Mid-Clavicular Line (MCL)</li> <li>• 6<sup>th</sup> Inter-Costal Space</li> </ul>	Surface Anatomy
The Patient <b>Tilting his head Down</b> - the 1 <sup>st</sup> spine appear is <b>C7</b> .. then go Down	The Patient <b>Rise his hand</b> - the 1 <sup>st</sup> Rib to meet is <b>4th</b> .. then go Down	معروفة يعني	نجيبها إزاي
			<b>Lesser Transverse Fissure</b>
	<ul style="list-style-type: none"> <li>• Mid-Axillary Line (MXL)</li> <li>• 5<sup>th</sup> Rib or Inter-Costal Space</li> </ul>	<ul style="list-style-type: none"> <li>• Para-Sternal Line or Mid-Line</li> <li>• 4<sup>th</sup> Rib</li> </ul>	<b>On Rt. Side ONLY</b>
			Surface Anatomy

Rt. Lung	Lt. Lung
<b>2 Fissures</b> (Greater Oblique Fissure & Lesser Transverse Fissure)	<b>1 Fissures</b> (Greater Oblique Fissure Only)
<b>3 Lobes</b> (Upper, Middle & Lower)	<b>2 Lobes</b> (Upper & Lower)
<b>10 Broncho-Pulmonary Segments</b>	<b>9 Broncho-Pulmonary Segments</b>
Rt. Side > Lt. Side by 1 Always	

يتسألوا إزاي في العملي !؟	
1• Direct Qs .. What is the Surface Anatomy of Lung ?	
<b>2• Examine the Middle Lobe ?</b> - go to the <b>4<sup>th</sup> Inter-Costal Space</b> on the <b>RIGHT SIDE</b> , then <b>Move a little bit Lateral</b> , then Listen by Stethoscope <b>N.B. NEVER do it on THE LEFT SIDE or at the BACK</b>	<b>3• Examine the Apical Segment of Lower Lobe ? At the BACK</b> - Patient will <b>Sit Down</b> , then <b>Tilt his head Down</b> , the 1 <sup>st</sup> spine appear is <b>C7</b> .. then go Down to <b>T3</b> then Listen by Stethoscope






* Chest Investigations :					for	
<div>■ Investigation Scheme :</div> <div>1- Laboratory :<ul style="list-style-type: none"><li>• Blood</li><li>• Urine &amp; Stool</li><li>• Others</li></ul></div> <div>2- Graph.</div> <div>3- Radiological :<ul style="list-style-type: none"><li>• Plain X-ray</li><li>• with Contrast</li><li>• Others</li></ul></div> <div>4- U/S.</div> <div>5- C.T. &amp; MRI</div> <div>6- Nuclear Medicine</div> <div>7- Endoscopy</div> <div>8- Catheter</div> <div>9- Biopsy</div> <div>10- Others (P.F.T.)</div> <div>Invasive</div>					Complications & Function	
<div>1 • Cor-Pulmonale : (will show Heart Failure or Rt. Vent. Enlargement)</div> <div>2 • Respiratory Failure : [it's Investigation Diagnosis]  * The Most Common Patient Liable to Complicate with Resp. Failure is COPD Pt. esp. Resp. Failure Type II</div> <div>- by H/O : History of Systemic Venous Congestion</div> <div>- by Examination : Rt. Sided Heart Failure Sign</div> <div>- by Investigation :<ul style="list-style-type: none"><li>• ✖ of Heart Failure → it's a CLINIACL Diagnosis (No Investigation)</li><li>• ✔ of +++ Rt. Vent. Enlargement → ECG "but all investigation will show it"</li></ul></div> <div>- it's Suggested Clinically by ( Cyanosis, Flapping Tremors &amp; Disturbed Conscious Level )</div> <div>- by Investigation : Arterial Blood Gases (ABG) * Arterial Sample ONLY .. for ( Pressure O<sub>2</sub> , Pressure CO<sub>2</sub> &amp; pH ) N.B. Normal O<sub>2</sub> Pressure = 100% , Normal CO<sub>2</sub> Pressure = 40% # it's Resp. Failure when : لازم تلاقيه • PO<sub>2</sub> ↓ to 60% (it's a MUST to Find O<sub>2</sub> Level ↓) = HYPOXIA مش لازم تلاقيه • PCO<sub>2</sub> ↑ to 50% (it's Not a MUST ) = HYPERCAPNIA # there are 2 Types of Resp. Failure .. - Type I (Hypoxia Only) فيه حاجة واحدة بس - Type II (Hypoxia &amp; Hypercapnia) فيه حاجتين</div>						
1 • T.B. see Later					Etiology	
2 • Irritation - by H/O : Smoking, Working, ..... But Nothing in Investigation to be Done						
3 • Allergy [Bronchial Asthma, Asthmatic Bronchitis]  - by H/O : the Patient will complain of Symptoms و Characterized by : <ul style="list-style-type: none"><li>• Paroxysmal Attacks</li><li>• it has Precipitating Factors</li><li>• it has Relieving Factors</li></ul> + Investigation Not Needed .. but upon Request we could do these Investigations "أي كلام كلهم" - Blood Picture : will find Eosinophilia & ↑ IgE - Sensitivity Tests						
		1 <sup>st</sup> Investigation	then	then	then	Main Diagnosis
1 • COPD		Plain X-ray	★ Pulmonary Function Tests will show Obstructive Pattern	-	-	
2 • S.L.S.	• Broncho-Ectasis	Sputum Analysis for Infection	Plain X-ray	Broncho-Graphy إذا مش شغال بـ نعمل ده	★ C.T. ± Broncho-Scope to Exclude Abscess	
	• Lung Abscess	Sputum Analysis for Infection	Plain X-ray	± Broncho-Graphy to Exclude Broncho-Ectasis	★ C.T. ★ Broncho-Scope لازم بنعمل الأثنين مع بعض	
3 • Pulmonary Fibrosis (Parenchymatous Type)		Plain X-ray	★ Pulmonary Function Tests will show Restrictive Pattern	-	-	
4 • Pleural Effusion		★ Plain X-ray بنعمل الأثنين مع بعض تثبت أنه موجود	★ Aspiration عشان تعرف طبيعته	± Pleural Biopsy	-	
5 • Surgery		-				

• Tuberculin Test			
[is a Skin Test that Detects Delayed Hypersensitivity (Type IV) Response to Previous Exposure of the Host to the Tubercle Bacilli] - it's one of the Main Tests used to Diagnose LATENT Tuberculosis Infection			
• Underlying Mechanism :	• as a Result of Previous Exposure of the host to Tubercle Bacilli → Th1 Cells are Sensitized, Activated & Clonally Expanded • in +ve Reactors; the Injected Tuberculin Substance Stimulate the Pre-Sensitized Th1 Cells Th1 Cells → Secrete Cytokines و Recruit Inflammatory Cells Particularly Macrophages - the Result is a Raised, Indurated Area around the Site of Injection N.B. No Reaction is seen in People who have Not been Sensitized to TB		
• Technique :	• 0.1 ml of Purified Protein Derivative (PPD) Containing 5 Tuberculin Unites (TU) is Injected Intra-Dermally in the Skin of the Anterior Aspect of the Forearm • the Result is read After 48-73 Hrs. by PALPATING for the Presence of INDURATION & Measure its Diameter (NOT the Erythema)		
• Interpretation :	Reaction have been Categorized by Different Criteria (Risk Factors) Depending on the Circumstances of the Patients		
	"5-10-15 Millimeter System"		
	5	10	15
	Indurations 5> ml.	Indurations 10> ml.	Indurations 15> ml.
	• Considered Positive for : <ul style="list-style-type: none"><li>- People who have Had TB Disease before</li><li>- Close Contacts of People with Infectious TB</li><li>- People with HIV Infection</li></ul>	• Considered Positive for : <ul style="list-style-type: none"><li>- People who in Endemic Areas where TB is Common</li><li>- People with Certain Medical Conditions e.g. Diabetes</li><li>- Un-vaccinated Children Younger than 4 Years Old</li></ul>	Considered Positive *even in Absence of Any Risk Factors
• False -ve Results :	1- Anergy: it's Inability to React to Tuberculin Test because of Weakened Immune System e.g. Severe TB Disease, HIV Infection or Cancer 2- Recent TB Infection: after exposure, it takes 2 to 10 Weeks for Tuberculin Test to become +ve		
• False +ve Results:	1- Infection with Non-Tuberculous Mycobacteria (NTM): due to Cross-Reaction with M. tuberculosis Antigens 2- Vaccination with Bacille Calmette-Gu é rin (BCG): after BCG Vaccination, Tuberculin Skin Test Remains +ve for up to 5 Years		

	± Technique		Indication تعمل لـ العيان أيه ؟!	Value هـ تبين أيه ؟!	بيان إزاي ؟! its Reading see Para-Clinical Notes	
• Labs :						
<b>1 • Sputum Analysis :</b> مزرعة بلغم  (it's <u>Not</u> Investigation of Choice .. but, it may be the <b>1<sup>st</sup> Investigation</b> to be done)	# Analysis Aspects		العيان يَبْصُقُ .. غالباً العينة هـ تكون متلوثة .. Usually the Sample will be <b>Contaminated</b> by Oral Commensals Bacteria  إذا الدكتور سأل ما تقولهاش من نفسك we can use <b>Broncho-Scope</b> to get clean Samples	—	↓	
	a • Macroscopic	- Physical Properties - Chemical Analysis				
	b • Microscopic	- Cells - Organisms				
	c • Culture & Sensitivity					
<b>2 • Serous Aspirate Analysis :</b> For Pleural Fluid	• via Thora-Centesis.. (we insert the Needle <b>ABOVE</b> the Rib to <b>Avoid Injury of the Intercostal Nerve</b> ) Then, do <b>Analysis for the Aspirated Fluid</b> as previous mentioned in sputum analysis		• <b>Pleural Effusion</b>	# by X-ray we will Diagnose the Pleural Effusion .. but we do Aspiration to <b>Categorize the Effusion</b> (Transudation, Exudation, Chylous & Malignant) See next page		
<b>3 • Sweat Analysis :</b> تقولها لما الدكتور يسألك	• give the Patient “ <b>Pilocarpine</b> ” to make him Sweat		• <b>Cystic Fibrosis</b> .. as it present as S.L.S.	—		
• Radiological :						
<b>4 • Plain X-ray :</b>	مؤجل		• <b>All Chest Cases</b>	For each Disease there’s a Certain Pattern • in <b>Pleural Effusion it’s the Invest. Of Choice</b> - in <b>Postero-Anterior View</b> & - in <b>Lateral View</b> for <u>Minimal</u> Effusion		
<b>5 • Contrast *هام (Broncho-Graphy) :</b>  ب ينزل في اللجنة ك أشعة .N.B.	# المادة ما هي ؟!		• <b>S.L.S. especially Broncho-Ectasis</b> - It was the Investigation of Choice <u>until</u> the C.T. has been Discovered	• <b>Confirm the Diagnosis ..</b> as X-ray could Miss the Diagnosis • <b>Determine the Type of Broncho-Ectasis ..</b>  <div><div>Fusiform Type ( <b>Bad Prognosis</b> )</div><div>Saccular Type</div></div> • <b>Determine the Site (و Segment) العلاج</b>		
	✗ Lipidol (contain <b>Iodine</b> )	✓ Hytrast (و Now Used)				
	• <b>Iodine Sensitivity</b> • Fat Soluble → <b>Fat Embolism</b>	• <b>Free of Iodine</b> • <b>Water Soluble</b>				
	# ما هي طريقة إدخالها ؟!					
	via Broncho-Scope .. with Anesthesia					
	# أيه هي مشاكلها ؟!					
	1- <b>Iodine Allergy</b> 2- <b>Anesthesia Complication</b>	3- <b>Fat Embolism</b> 4- <b>Spread of Infection</b> in Acute Attack				
<b>6 • C.T. :</b>	مؤجل		• <b>S.L.S. for both (Abscess &amp; Broncho-Ectasis)</b> * but for Broncho-Ectasis as the lesion is too Small, we use <u>High Resolution C.T. (HRCT)</u> with Minimal Thickness Cut (but it’s <u>Much More Expensive</u> ) • <b>Interstitial Pulmonary Fibrosis</b>	—		
<b>7 • Endoscope = Broncho-Scope :</b> هام جداً شفوي*  “there are 2 Types : <b>Rigid</b> & <b>Fibro-Optic (Flexible)</b> ”	# What is the Indication for Broncho-Scope ؟! شفوي		• <b>S.L.S. especially Lung Abscess</b>	# What are the Value in Lung Abscess ؟! • to <b>Visualize the Lesion</b> • to <b>Take a Biopsy</b> (as 50% are Malignant) • to <b>Remove F.B.</b> (it’s usually the Cause of Abscess)		
	Diagnostic	1• to Visualize the Lesion 2• to Take a Biopsy				From Lesions in Endothelium Lining Bronchi [Endo-Bronchial] e.g. Bronchogenic Carcinoma
		± <b>Broncho ALVEOLAR Lavage (BAL)</b> via Injection of Saline a wash the Alveoli .. the aspirate the wash and Analysis it				
		Therapeutic				1• Removal of F.B. or <b>Mucus Plug</b> 2• to Insert Medications : Antibiotics or Cyto-Toxic Drugs
± <b>to Stop Severe Hemoptysis</b>						
<b>8 • P.F.T.</b>	See next page					

## Pulmonary Function Tests (P.F.T.) مهم جداً جداً

■ <b>What's The Pulmonary Function ?!</b>		Spirometer مقياس التنفس		for Accurate Diagnosis
1- <b>Ventilation</b> : the Air Enter the Lung		• the Results will be express as a Graph ( <b>Spiro-Graph</b> )		
Almost the Disease affect this Function				
→ ↓ ( <b>Hypo-Ventilation</b> ) .. either				
• <b>Obstructive</b> الدُّنْيَا مسدودة e.g. COPD		1 • <b>Forced Vital Capacity (FVC)</b>		(FVC) (normally ≈ 5 Liters)
• <b>Restrictive</b> مش قادر أفتح e.g. Fibrosis & Effusion		[Volume of Air Expired by Max. Expiration following Max. Inspiration]		العيان ياخذ أقصى نفس عنده .. وبعدين يخرج أقصى نفسه عنده (ومش مهم المدة الي هـ يخرج فيها النفس)
2- Diffusion : the Air Enter the Alveoli		2 • <b>Forced Expiratory Volume in 1<sup>st</sup> Second (FEV<sub>1</sub>)</b> .. it Depends on Diameter of Airway (as Diameter ↑ → ↑ FEV <sub>1</sub> )		(FEV <sub>1</sub> ) (normally ≈ 4 Liters)
3- Perfusion : the Air exchange with Blood		[Volume of Air that has been Exhaled at the End of the 1 <sup>st</sup> sec. of Forced Expiration]		العيان ياخذ أقصى نفس عنده .. وبعدين يخرج أقصى نفسه عنده .. ونحسب الهوا الي خرج في أول ثانية بس
		3 • <b>Forced Expiratory Ratio (FER) = FEV<sub>1</sub>/FVC ... *</b> in COPD, FER will ↓		(FER) (normally ≈ 4/5 = 80%)
* <b>Indications :</b>		N.B. Spirometer is <b>Expensive</b> & <b>Need an Expert Doctor to Do it</b> ,		
• <b>COPD , Fibrosis</b>		so we Do it <b>Once</b> for Accurate Diagnosis & Determination of the Treatment .. then change into ( <b>Follow up Tests</b> )		
* <b>Value :</b>				
• to Know the Nature of Lesion (Obstructive, Restrictive or Mixed)				
• to Know the Degree of Lesion via % of FER (Prognostic Value)				
• to <b>Determine the Reversibility of Lesion</b> (e.g. in case of Broncho-Spasm .. do the test (FEV <sub>1</sub> ) .. then give the Patient Broncho-Dilator .. then Repeat the test (FEV <sub>1</sub> ) if it's Improved → it's Reversible Lesion)				
N.B. we have to <b>Determine the Reversibility of Lesion</b> as we will Treat the Patient with a <b>Drug for Life</b> which has also a <b>Side Effect</b> .. so we need to Know if this Drug is <b>Beneficial</b> or Not				
Peak Expiratory Flow Rate (PEFR) أسم الإختبار				
Peak Flow Meter أسم الجهاز				
		بـ يقيس معدل خروج الهواء في وحدة الزمن		Flow Meter
		لـ أنه الجهاز لما العيان ينفخ فيه المؤشر هـ يعلى لـ مستوى مُعين .. بس لما العيان يشيل بوقه من الجهاز .. المؤشر هـ يفضل مكانه في أعلى نقطة وصلها (إلا إذا العيان داس على زرار في الجهاز ورجعه لـ الصفر)		Peak
.. it Depends on Diameter of Airway (as Diameter ↑ → ↑ PEFR) .. & as the +++ PEFR .. this mean that the Patient Condition is Improve				for Follow-up
* <b>Technique :</b>				
• 1 <sup>st</sup> patient should take a 3 repetitive Respirations .. then he Expired the Air				
★ N.B. <b>NOW .. the New Classification of Bronchial Asthma is Depend on (PEFR)</b>				
Match Test “very Famous but Not Accurate” الكبريت		Forced Expiratory Time (FET) “very Accurate”		
بـ تشوف العيان يقدر يطفي عود الكبريت من على بعد كام سم ..		بـ نخلي العيان يطلع نفس جامد		
* بس خلي بالك : <b>العيان لازم يكون فاتح بوقه جامد ..</b>		& the Doctor <b>put the Stethoscope on the Trachea</b>		
عشان ما يستخدمش عضلات بوقه في النفخ .. إحنا عايزين الهوا الي خارج من الرئة بس		by Stopwatch : Determine the Time for <b>Expiration</b>		
* if Patient Can NOT Snuff Out the Match from a Distance < 15 Cm. .. this = <b>OBSTRUCTION</b>		(as the Time +++ > 5 Sec. .. this = <b>OBSTRUCTION</b> )		
		N.B. the Results of this Test is Comparable to the Results of Spirometer		
		الأفضل ليك أنك تعمل الإختبار ده ع الحالة من قبل ما يتطلب منك (منظرك قدام الدكتور وكدزه يعني) 🏠		

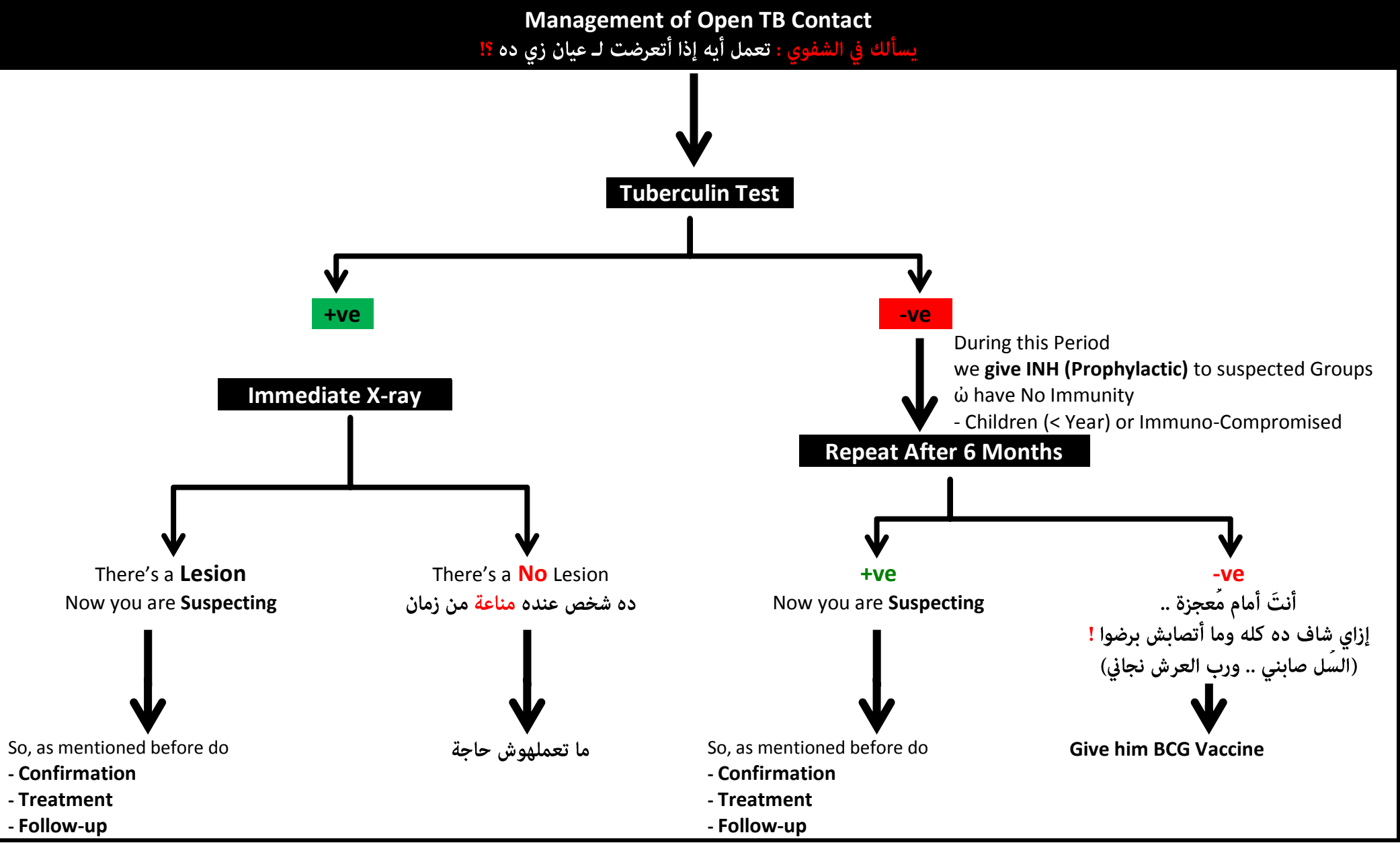
Categorize the Effusion				
Transudation		Exudation	Chylous	Malignant Effusion
< 3 gm %	Protein	> 3 gm %	• Milky White	• Hemorrhagic, Massive, Rapidly Re-Accumulating After Aspiration
< 1016	Sp. Gravity	> 1016	• Contains Many Fat	• Contains Malignant Cells
< 200 IU/L	LDH	> 200 IU/L	• Clear on Addition of Ether	• The Mediastinum may be Shifted to Same Side of Effusion due to Underlying Lung Collapse
< 1000 /ccm	Cells (WBCs)	> 1000 /ccm	• Stain Orange with Sudan III	



Tuberculosis (TB) “it’s a MICROBIOLOGY Disease” مهم جداً جداً عملي وشفوي** وتحريري				
N.B. TB is Included in Almost All Chest Cases		• <b>Pleural Effusion</b> as TB is the Commonest Cause • <b>Pulmonary Fibrosis</b> as TB is the Only Cause • <b>Lung Abscess</b> as TB is Producing Cavities in the Chest • <b>Broncho-Ectasis</b> as TB is Producing a Weakness in the Wall of Bronchi		ف في اللجنة لما ينزل العيان .. ب يبقى نص اللجنة ع المرض الموجود .. والنص الثاني على الـ TB
* <u>Diagnosis :</u>				
For Suspecting TB	1 • X-ray			
	2 • Tuberculin Test    discussed before			
For Confirmation of TB	3 • via Finding TB Bacilli in Samples			
	• What is the Possible Samples <b>?!</b> - <b>Sputum لازم</b> If Patient could Not Cough, The Doctor will <b>Encourage him to Cough</b> by Fluid Medication even in Children (they Swallow their Sputum) so, we Take the Sputum Sample via <b>Gastric Aspiration</b> N.B. we Take a <b>3 Sample</b> .. in <b>Different Times</b> - Pleural Aspiration ± Pleural Biopsy		• What do we do for Samples <b>?!</b> <b>A - Staining (Ziehl–Neelsen stain)</b> <b>It’s a Specific Test but Not Sensitive</b> = if it’s +ve ð mean there’s Acid Fast (Resistant) Bacilli in Sample → Patient is Infected & you Have to Tell him (هتقوله العينة طلعت إيجابي) <u>but</u> if it’s -ve .. you still Suspect <b>B - Culture &amp; Sensitivity (Löwenstein–Jensen (L J) medium)</b> It take <b>More than 4 Weeks</b> * nowadays we use ( <b>Bactec medium</b> ) to Shorten the Time	
	We Need to be SURE about the Diagnosis .. because upon this we will Decide a Management Plan with a Long Period Drugs ð have a lot of Side Effects			
For Follow-up	4 • Clinically .. (الأعراض تتحسن ( ترجعله شهيته لـ الأكل .. ووزنه يزيد .. ويبطل يعرق )			
	5 • Radiological .. the Lesion will get Small			
	6 • ✓✓✓ MicroBiology ..			
	• -ve Sputum Sample (After 2 Months from Starting of Treatment) But .. Patient is Non-Infectious After 2 Weeks Only (as the Infectivity needs a Certain Number of Organism ð Decline after Starting of ttt) <u>Q: After 2 Months of Treatment .. the Sample Still +ve ! what is your Explanation ?!</u> - Faulty Treatment                      - it’s Resistant Strain			
* <u>Treatment :</u>				
Stage 1	• Sanatorium    مُستشفيات الصدر		It’s OBSOLETE nowadays	
Stage 2	• Surgeries			
Stage 3	• Medical Treatment			
Drugs (Anti-Tuberculous Drugs)				
1 <sup>st</sup> Line # .. مطلوب فيهم كل حاجة .. = All of these Drugs I can Start the Treatment with it			2 <sup>nd</sup> Line # مطلوب فيهم الأسم فقط .. ما عدا واحد = these Drugs have Many Side Effects	
Drug	Dose		Side Effects	N.B. <b>Para-Amino-Salicylic Acid (PASA)</b> أبو قُرطاس Previously it was Considered a 1 <sup>st</sup> Line Drug .. but after Discovering that it’s “Bacterio-Static” it turns to be 2 <sup>nd</sup> Line Drug  معنى كده إن العيانيين إذا كانوا أخذوا الدواء من زمان .. ف هـ يكونوا أخذوا الدواء ده .. وجرة الدواء ده كانت 20 جرام كل يوم .. والقرص الواحد = نص جرام .. ف كانوا بـ يدوا العيان <b>قرطاس</b> في الأقراص ويقول له (قر قز) 🍷 ف العيان يجيلك الشيبيت يقولك وكنت بـ أخذ أبو قرطاس .. ف لازم تبقى عارفه
Isoniazid (INH) أقراص	5 mg/kg/day	Orally	- Hepato-Toxicity (CAH) - Peripheral Neuropathy mainly Sensory - Psychosis & Epilepsy - Lupus-Like Manifestations	
Rifampicin كابسولات	10 mg/kg/day	Orally	- Hepato-Toxicity - GIT Irritation - Red Colored Urine	
Streptomycin حقن	15 mg/kg/day	I.M.	- Nephro-Toxicity - Vertigo , Deafness - Ataxia , Nystagmus	
Ethambutol	25 mg/kg/day	Orally	- Optic Neuritis	
Pyrazinamide	30 mg/kg/day	Orally	- Hepato-Toxicity - Hyper-Uricemia	
Regimen				
1# Long Duration			2# Multiple Drugs	
• To <b>Prevent Relapse</b> as TB Bacilli <b>could Stay alive Inside Microphage</b> & After Death of Microphage the TB will Release .. Causing a <b>Relapse</b>			1 • To <b>Prevent Resistance Development</b> 2 • <b>Synergism</b> 3 • To ↓ <b>Doses</b> → ↓ <b>Side Effects</b> 4 • To ↓ <b>Duration of ttt</b>	
	Initiation ttt		Continuation ttt	
	• in the 1 <sup>st</sup> 2 Months                      • Not Less than 3 Drugs		• in the Rest of Treatment Time                      • 2 Drugs Only	
• <b>Standard Regimen</b> (9M) ده أتلغى	2 Months 1• Rifampicin 2• Isoniazid (INH) 3• Streptomycin or Ethambutol		7 Months 1• Rifampicin 2• Isoniazid (INH)	
• <b>Short Regimen</b> (6M) This now is the Standard	2 Months 1• Rifampicin <b>زودت دواء واحد .. وقللت 3 شهور</b> 2• Isoniazid (INH) 3• Streptomycin or Ethambutol 4• <b>Pyrazinamide</b> “it Kill TB Intracellular (Macrophage)”		4 Months 1• Rifampicin 2• Isoniazid (INH)	
• <b>Long Regimen</b> (9 or 12M)	# It Indicated in : • Extra-Pulmonary TB ( TB Meningitis, Bone, ....) • Immuno-Compromised Patients			

N.B. Nowadays, TB is <b>HOME Treatment Only</b> زمان كان في المُستشفيات		
Indication of Administration into Hospitals are :	1• Severe Pulmonary TB 2• Immuno-Compromised Patients 3• Resistant Cases	
طريقة إعطاء الدواء	• Non-Supervision Therapy (NST)	ب ندي العيان الدواء كل شهر .. وهو ياخده لوحده من غير ما حد يشرف عليه <b>عيبه</b> : أنه ممكن العيان ينسي ياخذ الدواء .. أو يبيع الدواء
	• Direct Observation Therapy (DOT)	في واحد ب يروح لـ العيان كل يوم يديله الدواء ويتأكد أنه أخذ الدواء <b>عيبه</b> : أنه لازم تُوفر موظف يعدي ع العيان كل يوم يديله الدواء
جُرعات الدواء	• Continuous Daily Dose	يومياً
	• Intermittent Weekly Dose	مرتين في الأسبوع (ب تجيب نفس النتائج + أسهل)
<b>* Multi-Drug Resistant TB (MDR-TB) :</b>		
• Definition :	[it's a TB ʁ Resistant to Both Rifampicin & INH]	
• Types :	• <b>1ry</b> : from the Start the Patient is Infected with a Resistant Strain	
	• <b>2ry</b> : Patient is Infected with Normal Strain .. but it Develop a Resistant with time	
• Risk Factors :	• <b>Faulty Treatment</b> e.g. the doctor start ttt with Only 1 Drug <u>or</u> Patient did not take the drugs • <b>Doctors &amp; Medical Students</b>	
• Diagnosis :	• ✓✓ via Culture & Sensitivity : ده الصح	
	• في مصر مش ب نعمل كده .. مع الأسف ب نبدأ العلاج ع طول .. وإذا العيان ما أستجابش ليه بعد شهور .. ب نشخص <b>!</b>	
• Treatment :	- <b>24 Months Continuous</b> - <b>Pyrazinamide</b> + Quinolones " (ده اللي عليه خلاف في الأبحاث ) : "	(N.B. absolutely we will not giving Rifampicin & INH)

N.B. nowadays .. there's a New term called **Extreme-Drug Resistant TB (XDR-TB)** [it's a TB ʁ Resistant to All Drugs]



N.B. in Practical : if the Patient said that he took (**5 Drugs !**) for treatment of TB the 5<sup>th</sup> Drug is most probably Vitamin as there's No TB Regimen with 5 Drugs **!**